

Stockton Fish & Wildlife Office Pacific Southwest Region

FY 2011 Highlights



Greetings and welcome to the fifth edition of the Stockton Fish and Wildlife Office annual Highlights Report for 2011. The following pages display both photographs and articles written by our very talented and dedicated employees, sharing their passion for their work. Please enjoy this very brief glimpse into our efforts to engage people in nature, improve our communication, and collaborate with partners. I offer very special thanks to all of our employees for their contributions to this edition. You are a great bunch of professionals doing wonderful work! All editions of these Highlights Reports can be found on our website at <http://www.fws.gov/stockton> along with additional information about our programs and activities.

Please let us know if you have ideas for stories or are interested in participating in collaborations with us in the future. While we will continue our core programs during 2012, we will also continue to engage in many new and challenging opportunities, continuing to learn, grow and develop new expertise along the way. As reflected in our Office Vision statement below, we are dedicated to specific ideals that will carry us into the future in the San Francisco Bay-Delta and Central Valley region.

Stockton Fish and Wildlife Vision:

The Stockton Fish and Wildlife Office is an organization that promotes native self-sustaining ecosystems through leadership in anadromous fish restoration, fisheries research and monitoring, and non-native invasive species prevention, management, and control.

To achieve our objectives, we foster and value strong productive collaborations both internally and with peers, stakeholders, and the public.

Our work towards recovery and conservation of species and their habitats is governed by honesty and integrity and incorporates excellence in science, creativity, and flexibility.

As well as the commitments expressed in our U.S. Fish and Wildlife Service Mission: *Working with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.*

Thank you again for all of your continued support. We look forward to another great year in 2012!

Sincerely,

A handwritten signature in black ink, appearing to read "Kim Webb", written in a cursive style.

Kim Webb
Project Leader
Stockton Fish and Wildlife Office

Program Summaries

CVPIA Anadromous Fish Restoration Program Accomplishments

by Ramon Martin

The mission of the Anadromous Fish Restoration Program (AFRP) is to make all reasonable efforts to double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis. Since the settlement of California's Central Valley in the 1800's, anadromous fish species including Chinook salmon, steelhead, white sturgeon and green sturgeon have dramatically declined. Habitat degradation is the major cause of this decline. Doubling existing numbers of anadromous fish requires partnerships, local involvement, public support, adaptive management and the flexibility to pursue unforeseen opportunities.

In this reporting period, the AFRP completed two fish passage projects in the Cosumnes and Calaveras rivers, restored 640 feet of side-channel and two acres of floodplain habitat in the Stanislaus River, and placed approximately 86,180 tons of gravel in the American, Mokelumne, Merced, and Tuolumne rivers. Access to over 90% of the historic anadromous fish habitat in the Central Valley has been blocked by dams and migration barriers. Improving the opportunity for adult anadromous fish to reach their spawning habitats in a timely matter and improving habitat for all life stages of anadromous fish are important objectives of the AFRP and are crucial components in the maintenance and restoration of aquatic species and their habitats. The Budiselich Diversion Dam was one of 35 high priority barriers identified in the Calaveras River. The Rooney Brothers Diversion Dam was the last significant barrier without a fishway in the Cosumnes River. Anadromous fish passage was improved at both of these barriers by constructing a boulder weir fishway. Final placement of the boulder weirs was completed restoring access to about 10 miles of habitat in each river.

The AFRP also improved spawning and floodplain habitat in the American, Mokelumne, Merced, and Tuolumne Rivers. Construction activities during the summer included placement of approximately 11,200 tons of gravel in the

American River, 9,180 tons of gravel in the Mokelumne River, 39,200 tons of coarse sediment for spawning habitat in the Merced River, and 26,600 tons of gravel and coarse material were excavated from approximately 8 acres of dredger mining tailings in the Tuolumne River. The Mokelumne River Spawning Habitat Improvement Project area is rigorously characterized and monitored each year for spawning activity, bed form, and function. This year over 203 Chinook salmon redds were documented in the gravel enhanced area of the Mokelumne River. The Merced River Ranch Floodplain Enhancement Project was initiated last year and once fully implemented, up to 6 acres of riparian floodplain and 1.23 miles of spawning habitat will be restored. In FY11, AFRP staff worked with multiple water agencies to coordinate fall pulse flows in the San Joaquin River Basin tributaries, Mokelumne River, American River, and Sacramento River. The AFRP continued monitoring and evaluation to assess the effectiveness of these measures by implementing red dewatering studies and collecting real-time monitoring data through fish counting weirs. For example, in FY11 the AFRP worked with the East Bay Municipal Utility District (EBMUD) and other signatories of the Lower Mokelumne Joint Settlement Agreement to adaptively manage the river system and coordinate fall pulse flows (64,000 acre feet) in an effort to improve adult Chinook salmon returns. These efforts led to the development of a pilot project that incorporated the management of the fall pulse flows in October and the closing of the Delta Cross Channel gates to minimize adult straying of Mokelumne origin Chinook salmon. Preliminary results of this experiment are very promising and may assist AFRP meet its watershed doubling goal in this watershed. The AFRP will continue to use the adaptive management process to design experiments that will improve management actions and inform the development of future projects.

Program Summaries

Delta Juvenile Fish Monitoring Program Summary

by Joseph Kirsch and Lori Smith

The Delta Juvenile Fish Monitoring Program (DJFMP) conducts annual monitoring of juvenile fishes, participates in multi-agency research activities, and contributes to several technical and management committees within the region.

A primary responsibility of the DJFMP is to monitor the non-benthic fishes of management concern, in collaboration with the Interagency Ecological Program (IEP), throughout the lower Sacramento and San Joaquin Rivers and the Sacramento-San Joaquin Estuary. These fishes include, but are not limited to, Chinook salmon, steelhead, delta smelt, and longfin smelt. The DJFMP has been conducting juvenile fish monitoring since 1976 and has evolved to address both water management practices and endangered species listings.

Over the course of the year (Oct2010-Sep2011), we collected a total of 6,797 samples distributed among three trawl sites and over 55 beach seine sites and handled over 13 million fish. The trawl sites, located at the entry and exit points of the Sacramento - San Joaquin Delta, provide natural resource managers and scientists with a relative abundance index of fishes migrating into and out of the Delta, whereas the beach seine sites generally provide both temporal and spatial distribution information of fishes occurring in the near shore habitats throughout the Sacramento-San Joaquin Estuary.

As part of our monitoring activities, we also recover coded wire tagged juvenile Chinook salmon that are released for numerous studies or management purposes within the watershed. Coded wire tags are small tags that are implanted into fish that contain information on the origin, release date, and other information for that specific release group. During this year, our staff captured and processed over 2,000 coded wire tagged salmon and provided the tag return data to our partner agencies. In addition to our monitoring activities, we

remained an active partner with several multi-agency research projects within the Estuary. We participated in two hydro-acoustic juvenile salmon survival studies (i.e., Vernalis Adaptive Management Plan and the 6-Year Study), a Chinook salmon genetics project, and one delta smelt migratory study (i.e., First Flush Study). The hydro-acoustic juvenile salmon survival studies, led by our Juvenile Salmon Survival Program, were to compare the survival and migration time of juvenile Chinook salmon within different migratory pathways in the Delta to assess an array of water management actions. The Chinook salmon genetics project, also led by our Juvenile Salmon Survival Program working in conjunction with Oregon State University, was to provide genetic samples from juvenile salmon that can be used



One of the many levee breaches along Liberty Island
Photo by USFWS

by geneticists to help develop other techniques to accurately identify the race of individuals observed within the Estuary. The First Flush Study was to see how an increase in turbidity (sediment load in the water) and various tidal stages affect the upstream migration of delta smelt. Our involvement in these studies included providing staff, technical assistance, boats, and sampling equipment to help facilitate data collection and field operations lead by other agencies or institutions. The DJFMP also functioned as the program manager for the Breach III Project throughout the fiscal year. The Breach III Project brought

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together researchers from five academic institutions, two government agencies, and a private consulting company from throughout the country to study tidal freshwater wetland ecosystem function and restoration.

The DJFMP coordinated the poster session at the IEP annual workshop and served on the planning committee for the workshop. DJFMP staff also contributed to fishery related proposal reviews, the determination of future research needs, and coordination activities through our participation on the IEP Management Team, Pelagic Organism Decline Management Team, and other project work groups.

In addition to our fish related activities, the DJFMP participated in several outreach events throughout the year.

Aquatic Invasive Species Program Summary

by Ron Smith

The Aquatic Invasive Species (AIS) Program provides leadership in preventing, managing and mitigating the impacts of invasive species on ecosystem health throughout California and Nevada. High profile aquatic invasive species include but are not limited to: Chinese mitten crab, quagga and zebra mussels, New Zealand mudsnail, European green crab, and *Undaria pinnatifida*, an invasive brown kelp. The AIS Program has continued working throughout 2011 to establish baseline measurements of AIS populations within aquatic habitats throughout California and Nevada through partnerships with other agencies.

The AIS Program continued to enhance partnerships and cooperative efforts by working with national and regional programs including the Aquatic Nuisance Species Task Force, Invasive Species Council, Western Regional Panel, and 100th Meridian Initiative.

The AIS Program education and outreach efforts have resulted in increased awareness about the threat of AIS and measures to detect and prevent their introduction into Regional

waters. In order to meet our goals of managing the spread of invasive species, we have developed a new training program focused on the early detection and monitoring of quagga and zebra mussels. This training program was successfully integrated into our training and outreach program schedule. During 2011 we conducted 11 Early Detection & Monitoring workshops for quagga and zebra mussel, three Watercraft Inspection training workshops and four Hazard Analysis and Critical Control Point (HACCP) workshops as well as three AIS awareness workshops and three AIS program overview presentations. AIS program staff also participated in numerous outreach events throughout the region such as the California State Fair, regional salmon festivals, and other environmentally themed outdoor fairs. At these events we work to increase the public's awareness of invasive species issues and ways that everyone can help to minimize the spread of invasive species.

Additional information about all of the programs in the Stockton Fish and Wildlife office can be found at <http://www.fws.gov/stockton/>.



The Aquatic Invasive Species Program conducts a Zebra mussel early detection workshop
Photo by USFWS

Project Accomplishments

AFRP Enhances Passage and Habitat in the Cosumnes, Mokelumne, and Merced Rivers

December 1, 2010

by Ramon Martin, Donnie Ratcliff, Michelle Workman, and Zachary Jackson

Improving the opportunity for adult anadromous fish to reach their spawning habitats in a timely manner and improving habitat for all life stages of anadromous fish are highly important objectives of the Anadromous Fish Restoration Program (AFRP) and are crucial components in the maintenance and restoration of aquatic species and their habitats. Working to achieve these objectives, the AFRP completed one fish passage project in the Cosumnes River and placed approximately 15,000 cubic yards of gravel in the Mokelumne and Merced Rivers.



Placement of spawning gravel in the Merced River
Photo by Ramon Martin, USFWS

The Cosumnes River has 34 miles of historic anadromous fish habitat that once supported large runs of Chinook salmon. This river has been highly modified and many water diversion and groundwater recharge dams were built in the Cosumnes River to help meet the agricultural water needs of the region. The Cosumnes River Passage Improvement Project was funded by AFRP in the 2009 fiscal year with the intent to improve fish passage at these diversion dams. The Rooney Brothers Diversion Dam was the last significant barrier without a fishway in the Cosumnes River. Passage at this migration barrier was improved by constructing a four-tiered boulder weir fishway. Final placement of the boulder weirs was completed in late summer of 2010 and post-project monitoring documented over 700 adult Chinook salmon

migrating upstream through the fishway. In order to successfully implement this project the AFRP partnered with Fishery Foundation of California, Omochumne-Hartnell Water District, Robertson-Bryan, Inc., and California Department of Fish and Game (CDFG).

The AFRP also improved spawning habitat in the Mokelumne and Merced rivers. Construction activities included placement of approximately 4,166 cubic yards of gravel in the Mokelumne River and 10,772 cubic yards of coarse sediment for spawning habitat in the Merced River.



The Rooney Brothers Dam in the Cosumnes River prior to (top) and after (bottom) construction of the boulder weir fishway

Photo courtesy of Fishery Foundation of California

The Mokelumne River Spawning Habitat Improvement Project area is monitored each year for quality of available spawning gravel and subsequent spawning activity. Additionally, this effort serves as a foundation project for the development of the Spawning Habitat Integrated Rehabilitation Approach currently being developed and refined by the University of California, Davis. This year over 70 Chinook salmon redds were documented in the gravel enhanced area of the Mokelumne River.

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The Merced River Ranch Floodplain Enhancement Project was initiated this year and once fully implemented, up to 6 acres of riparian floodplain and approximately 1¼ miles of spawning habitat will be restored. The coarse gravel that was processed, sorted, and placed was the first of a larger three year project where gravel additions and other habitat improvements will be completed in the Merced River. The AFRP is collaborating with Santa Fe Aggregates, Inc., Merced Irrigation District, CDFG Ecosystem Restoration Program, and the California Department of Water Resources for the restoration projects in the Merced River and with the East Bay Municipal Utility District in the Mokelumne River.

International Chinese Mitten Crab Workshop

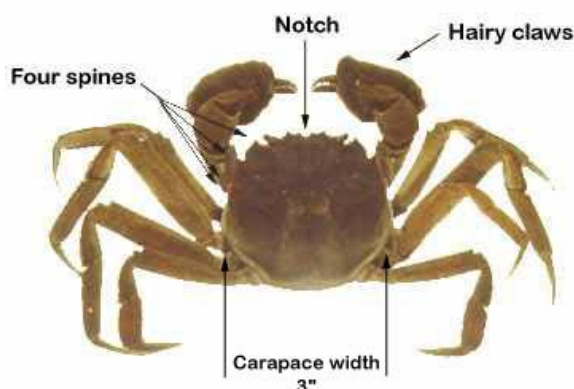
December 9, 2010

by Jonathan Thompson

As the Pacific Southwest Region Aquatic Invasive Species (AIS) Program has implemented the *Chinese Mitten Crab National Management Plan*, the need to develop a workgroup focused on Chinese mitten crab (*Eriocheir sinensis*) issues in North America was identified as a high priority.

On November 1, 2010, an international workshop, organized by the Stockton AIS Program, was held at the Service Headquarters in Arlington, Virginia. The workshop was attended by the Mid-Atlantic and North East Panels on Aquatic Invasive Species and numerous invasive species specialists from the U.S., Canada, and Mexico.

The goal of the workshop was to establish a North American Chinese mitten crab work group, develop a network of East and West Coast activities, and identify the future needs and direction for the *Chinese Mitten Crab National Management Plan*. Thanks to the workshop, the newly formed workgroup is holding monthly phone calls, an annual meeting, and has begun updating the *Chinese Mitten Crab National Management Plan*.



Chinese mitten crab

Photo courtesy of California Department of Fish and Game

In Greek, the term *eriocheir sinensis* is literally translated as “wool hand, the Chinese.” The Chinese mitten crab got its name because of the hair-like structures, or setae (hence the term “wool hand”), on its claws or cheliped. The crab is native to the South China Sea and its tributary rivers. The mitten crab is a catadromous species, which means that the adults spawn in the higher salinity waters of estuaries and their offspring migrate into freshwater to grow and mature. Once the crabs have reached sexual maturity, the adult crabs move downstream from their freshwater rivers and streams en masse and reproduce in the higher salinity waters of estuaries.

The Chinese mitten crab was first reported in the San Francisco Bay estuary in 1992, although it wasn't until 1998 when the mitten crab received its 15 minutes of fame when water exports had to be halted at the pumping facilities near Tracy, California because the crabs were so numerous that they severely impacted fish salvage activities.

Since 1998, the Chinese mitten crab population has not reached these epidemic proportions, but there are other potential impacts of this aquatic nuisance species' presence, such as effects on recreational and commercial fishing. The Chinese mitten crab is now being found with increasingly regularity in East Coast waterways. The Smithsonian Environmental Research Center summarized these recent

Project Accomplishments

observations— *“To date, there have been a total of one hundred forty-seven live Chinese Mitten Crabs (Eriocheir sinensis) reported and confirmed in the eastern United States. These crabs were found in Chesapeake Bay (2005-2007, 2009), Delaware Bay (2007, 2009-2010), Hudson River (2007-2010), and in New Jersey (2008-2010). In 2010 twenty Mitten Crabs have been captured in the lower Hudson River”.*

Stockton Fish and Wildlife Office Takes Part in the Smelt Turbidity Study

December 20, 2010

by Amber Aguilera

Field staff from the Delta Juvenile Fish Monitoring Program (DJFMP) provided a valuable service along with our partner agencies by participating in the 2010/2011 Smelt Turbidity Study. The purpose of this study was to see how an increase of turbidity (sediment load in the water) within the Sacramento-San Joaquin Delta triggers delta smelt, an endangered native species, to migrate upstream, and how these small fish use the ebb and flood tides to accomplish upstream migration. Sampling for the Smelt Turbidity Study took place between December 20, 2010 and January 2, 2011, when the first turbidity pulse was projected to flow into the Delta. Sampling was performed over roughly 12-hour periods which encompassed a full tidal cycle.

The study involved several different agencies including the United States Geological Survey, California Department of Fish and Game, San Francisco State University, and the University of California, Davis. The DJFMP portion of the study encompassed the near shore monitoring of fish using beach and purse seines within the Sacramento and San Joaquin Rivers, respectively. Thanks to the long hours in all weather conditions, sampling on both rivers was a success and we all look forward to future collaborative studies that will attempt to reveal the relationships between environmental conditions and native fish migration within the Sacramento-San Joaquin Delta.

Liberty Island Sampling Season is Teeming with Possibilities in Determining What Fish are Colonizing This Wetland Habitat

February 1, 2011

by Kate Erly

Adult and juvenile fish identification can be a difficult task with so many different species swimming the Delta. Now, shrink those fish down to 4mm, dye them pink, and preserve them in formalin. Skilled staff of the Delta Juvenile Fish Monitoring Program have spent hours in the lab peering through microscopes in order to learn which larval fish species are inhabiting Liberty Island, a restored freshwater wetland.

The DJFMP has been hard at work reenergizing a special study originally started in 2003-2004 focusing on larval fishes who now call Liberty Island their home. Liberty Island is located in the San Joaquin-Sacramento Delta, crossing into Yolo and Solano Counties.



Crystal Castle of the Delta Juvenile Fish Monitoring Program identifying larval fish in the lab.

Photo by USFWS

In 1998, Liberty Island, a once flourishing farmland subject to frequent flooding from levee breaks, began its transformation back to a tidally-influenced freshwater marsh when existing levee's breached and were not repaired. After just over a decade the island appears to be teeming with both vegetation and aquatic life.

Project Accomplishments

Starting in January 2011, the planning process took place to decide the most effective manner in which to execute the DJFMP's Liberty Island goal; to determine which fish are colonizing this recovering wetland habitat. From February through September 2011, crews ventured out to Liberty Island to sample larval fishes. Once a week, skillfully maneuvering 18-foot aluminum boats through the Delta system, Service staff made their way out to the north or south end of the island to conduct several surface trawls and collect environmental data. Once samples were back on dry land, the real fun began. Samples brought back to the lab were rinsed of chemicals and all fish were extracted and identified down to species using physical characteristics and dichotomous keys.



Denise Barnard and Amber Aguilera of the Delta Juvenile Fish Monitoring Program collecting and preserving samples in the field
Photo by USFWS

collections and our larval collections? Whatever our data may show, we are already eagerly looking forward to the 2012 sampling season where we anticipate expanding our current sampling efforts as well as adding a zooplankton component to the project.

Excited that our field season is coming to a close, we now can begin the process of interpreting the data. Will we find that this now submerged island complete with telephone poles and a road is now a safe haven for the native splittail, delta smelt, and longfin smelt? Will we find a correlation between our ongoing Liberty Island beach seine juvenile fish

Collaboration for Predator Collection at Liberty Island

March 16, 2011

by Jolene Willis

The Stockton Fish and Wildlife Office (STFWO) assisted the California Department of Water Resources (DWR) Aquatic Ecology Section from mid-March through June collecting fish species suspected of preying on larval Delta smelt.



Jolene Willis and Julie Wolford of the Stockton FWO arrive on site with Nick Van Ark from DWR and Jenny Melgo from Cramer Fish Sciences to complete a beach seine
Photo by Jared Frantzich, DWR

In 2010, a pilot study was conducted by DWR and University of California, Davis to detect the predation of Delta smelt based on the presence of Delta smelt DNA in the guts of piscivorous fishes.



Jolene Willis of the Stockton FWO complete a beach seine at Liberty Island with the help of Nick Van Ark of DWR
Photo by DWR

Following preliminary analysis, the genetic approach utilized in the 2010 pilot study appears to be both accurate and useful. As a result, DWR set out to collect fishes throughout the North Delta including Lindsey Slough,

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Cache Slough, the Deep Water Ship Channel and Liberty Island in hopes of garner additional information on predation rates.

The STFWO provided fishes of interest to DWR biologists while conducting routine fish sampling at over 20 Liberty Island beach seine sites. The working and professional relationship developed and maintained between DWR and STFWO remains a high priority and we hope to continue this collaboration in the future to further facilitate a better understanding of the effects of predation on native fishes.

2011 Interagency Ecological Program Workshop and California-Nevada Chapter of the American Fisheries Society Conference

March 30, 2011

by Jolene Willis

On March 30th, 2011, twenty one staff members from the Stockton office attended the joint Interagency Ecological Program (IEP) annual workshop, and the 45th annual California-Nevada Chapter of the American Fisheries Society's (Cal-Neva), which was held on March 30-April 2, 2011.

The IEP workshop focused on the ongoing projects and findings of multiple agencies, organizations, and academic institutions working within the Sacramento-San Joaquin Delta. Eighteen oral presentations were given associated with natural resource management, food webs, habitat, and near-shore fishes of the Delta. There also were over 20 posters presented which allowed attendees to read about research findings and converse with the authors. Jolene Willis, John Netto, and Lori Smith presented a poster on the spatial distribution of native fishes using a restoring tidal wetland in the Sacramento-San Joaquin Delta. The larval and adult/juvenile fish data presented was collected through IEP funding in 2004, 2005 and 2010 at Liberty Island. Gonzalo Castillo presented a poster on his work focusing on potential ways that delta smelt losses could be reduced at the State Water Project.

The Cal-Neva conference focused on the challenges created by new and existing threats to aquatic ecosystems including, but not limited to, invasive species, habitat degradation and loss, overexploitation, climate change, and the effect of the economy on fisheries resources and management. In addition to the many informative talks given, educational classes were also offered to provide certification in electrofishing and permitting for fish collection. AFRP staff Michelle Workman and Donnie Ratcliff each gave oral presentations. Michelle's talk focused on developing strategies to restore spring-run Chinook salmon to the San Joaquin River while Donnie talked about fish passage and habitat restoration on the Cosumnes River. In addition, Carl Mesick presented a poster examining coded wire tag recovery data from throughout the Central Valley.

Attending and participating in the IEP workshop and Cal-Neva conference provided an outstanding opportunity for Program staff to learn more about and educate others on the management, monitoring, and research of fishes within the Delta.

Conducting Juvenile Fall-run Chinook Salmon Survival and Migration Pilot Study in the San Joaquin River Helps Determine Best Management Actions

April 1, 2011

by Michelle Workman

The San Joaquin River Restoration Program (SJRRP) Fisheries Management Plan sets Chinook salmon population goals needed to successfully achieve the Restoration Goal as described in the San Joaquin River Settlement Agreement.

With these population goals in mind, the SJRRP conducted a pilot study utilizing acoustic telemetry to identify and characterize three possible limiting factors (predation, entrainment, and physical habitat) for juvenile Chinook survival as they move through the San Joaquin River Restoration Area. Additional knowledge of these possible limiting factors

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will help SJRRP biologists determine the best approach for: 1) reintroduction efforts, 2) developing habitat enhancement projects, and 3) prioritizing actions for the reduction or elimination of predation, entrainment and habitat impacts to fish survival.

The pilot study began in April with approximately 1,200 juvenile fall run Chinook salmon obtained from the California Department of Fish and Game's Feather River Hatchery. In order to track the movements of the released fish, a subset of these were tagged with acoustic transmitters and stationary telemetry receivers were deployed within the Restoration Area on the San Joaquin River from Friant Dam to the Merced River confluence.

The fish were released at two different locations – below Friant Dam (river mile 266) and at the San Mateo Crossing (river mile 212). Of the 192 fish released with acoustic transmitters, 71 were detected at the end of the Restoration Area at the Hills Ferry Barrier.

A Field Advisory with more details about the study is available on the SJRRP website at www.restoresjr.net/activities/field/index.html, and a preliminary report from this first effort of acoustic tracking of juvenile Chinook salmon was posted on the SJRRP website in July at www.restoresjr.net/flows/Fisheries/index.html. A final report on this study will be included in the SJRRP Annual Technical Report (ATR) and will be posted on the SJRRP website as part of the 2011 ATR Fisheries Appendix at <http://www.restoresjr.net/flows/ATR/>.



Michelle Workman, USFWS fish biologist, implants a juvenile Chinook salmon with an acoustic tag.

Photo by USFWS

The telemetry study will be continued in 2012 to analyze the movement of Chinook salmon in different water year types. Some conclusions from the preliminary report include relocating some receivers to improve fish detection and using additional receivers between the Mendota Pool and Sand Slough.

Chinook Salmon Tissue and Scale Collections Aim to Improve Future Race Designations

July 1, 2011

by Denise Barnard

July 2011 marked the end of a four year sampling project using genetic tools to more accurately define the races or runs of winter, spring, fall, and late fall Chinook salmon in the Sacramento and San Joaquin Rivers. Winter run salmon are listed as endangered under the Endangered Species Act (ESA), while spring run salmon are listed as threatened. Improving race designations may improve estimates of respective populations in sampled areas.

Races are currently designated using the "River Model," a technique developed by Frank Fisher of the California Department of Fish and Game (CDFG) in 1992. Fisher's method uses observed spawning times and fall run growth rates to predict when juvenile salmon of each race should appear in the Sacramento River and Delta at a given size. While this model is known to have some limitations, it is the only tool available to differentiate juveniles by race in the field and is widely used by all of the fisheries agencies in the Sacramento Valley.

The genetics project was led by biologist Patricia Brandes. Field crew from the Delta Juvenile Fish Monitoring Program, with funding from the Interagency Ecological Program, took tissue samples from Chinook salmon caught during regular trawl sampling in the Suisun Bay and Sacramento River near Sherwood Harbor.



Denise Barnard and David Dominguez, STFWO, sample tissue from the caudal fin of a juvenile Chinook salmon
Photo by USFWS

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Tissue samples were taken from the caudal fin of unmarked salmon (e.g., salmon which were not adipose fin clipped in a hatchery). In addition, we hope to explore the possibility of determining salmon race by analyzing scales, so two scale samples also were taken from each tissue-sampled fish in anticipation of later analysis. Roughly 4,300 salmon were sampled in 2011, producing 4,300 tissue and 8,600 scale samples.



Tissue sample taken from a juvenile Chinook salmon
Photo by USFWS

These tissue samples were sent to the CDFG Tissue Archive Lab in Sacramento prior to being sent to the lab of Dr. Michael Banks, of Oregon State University. Dr. Banks and his team will analyze specific DNA markers called microsatellites to predict the race of each sampled salmon.

This project could improve our ability to determine salmon races while sampling, greatly expanding our knowledge of Chinook salmon life history in the Delta. The genetic analysis portion of this study was funded through the Delta Science Council's Delta Science Program.

USFWS Partners with Stockton East Water District to Improve Fish Passage on the Calaveras River

September 7, 2011

by Donnie Ratcliff

On a warm September morning representatives from a multitude of Federal, State, Private and non-profit entities came together to celebrate the start of an exciting journey that will improve fish passage and aquatic connectivity on the Calaveras

River. Ground was symbolically broken at the Budiselich Flashboard Dam Fish Passage Improvement Project on September 7, 2011 and construction activities began in earnest the following Monday.



Representatives from several of the implementing and supporting entities break ground at the Budiselich Flashboard Dam Fish Passage Improvement Project
Photo by USFWS

The project will install seven boulder weirs and a modified rock ramp that will allow adult salmon to gradually gain the elevation needed to pass the dam and continue their journey to spawn. This design is also highly preferred by juvenile salmon as they begin their downstream journey to the ocean.

The lower portions of the Calaveras River are a complicated series of nearly 100 potential barriers to passage by aquatic species. A 2005 report by the California Department of Water Resources (DWR) identified over 35 of those barriers as high priority and most limiting to opening the river to migratory fish. The Calaveras River Fish Group, an interdisciplinary group of experts seeking to improve fish habitat in the Calaveras River, further refined those results and identified the four highest priority barriers for repair or removal. The Budiselich site is the first of those high priority sites to be addressed, and due to last winter and spring's large precipitation and runoff events the new boulder weir was functioning by the first of October.

The Service was represented at the event by Paul Cadrett (Stockton FWO Deputy Project Leader), Donnie Ratcliff (Habitat Restoration Coordinator, Anadromous Fish Restoration Program and Region 8 National Fish Passage Program Coordinator) and Kes Benn (Assistant Habitat

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Restoration Coordinator, Anadromous Fish Restoration Program).

Cadrett joined speakers from Stockton East Water District (SEWD) and DWR in commending all of the project partners on their efforts to get this important project funded, designed, and implemented. Ratcliff has participated in all aspects of the project from the inception of the process and facilitates the Calaveras River Fish Group.

The project is funded by the Service through the AFRP and National Fish Passage Programs, SEWD, DWR, and California Department of Fish and Game. The project will be implemented by SEWD with assistance from DWR's Fish Passage Improvement Program. Other partners in the project include NOAA's National Marine Fisheries Service, U.S. Army Corps of Engineers, University of the Pacific, Fisheries Foundation of California, and Friends of the Lower Calaveras River.

For a short video from the event please see: <http://riverofskulls.wordpress.com/2011/09/07/video-budiselich-flashboard-dam-fish-improvement-project-groundbreaking/>.

Study Looks at Restoration of Liberty Island

September 16, 2011

by Lori Smith

In 2009, Delta Juvenile Fish Monitoring Program (DJFMP) assisted in developing a study known as Breach III, to assess the effects of restoration on aquatic biota living in the tidally-influenced freshwater wetlands at Liberty Island and Little Holland Tract in Yolo County, California. The goals of the project were to provide a better understanding of how restoration activities influence local flooding and levee erosion and how abiotic and biotic factors control aquatic vegetation, fish, and wildlife.

This year the DJFMP collaborated with the University of Washington (UW) and Washington State University (WSU) to simultaneously look at the macro-invertebrate and fish response tasks of the study at Liberty Island during one of three hydrologic periods.

We assisted the universities by providing two boats as well as biologists and technicians to facilitate sampling.



Stockton Fish and Wildlife Office and Washington State University staff and students setting a Fyke net at Liberty Island

Photo by USFWS

The fish sampling, led by WSU, was designed to evaluate the use of a restoring wetland by specific life stages of delta smelt, longfin smelt, Chinook salmon, striped bass, threadfin shad, and Sacramento splittail. Adult and juvenile fishes were sampled using gill and fyke nets at six locations to monitor both the abundance and diet of fishes.



Fall out traps set at Liberty Island to collect insects

Photo by USFWS

In addition, we sampled larval fishes using trawls to monitor larval fish abundance throughout Liberty Island. The macro-invertebrate sampling, led by the UW, was designed to identify and monitor communities associated with the spatial and temporal development of the restoring wetland with emphasis on prey taxa of priority fishes. Members of the UW team took benthic core

Project Accomplishments

samples, conducted zooplankton trawls, and deployed insect fall-out traps to monitor the abundance of macro-invertebrates under the substrate, within the water column, and on the water's surface, respectively. The results from the fish and macro-invertebrate monitoring will be used in a model for predicting the ecological responses to change in habitat structure as a restoring system passes through the vegetation re-colonization threshold and continues to expand into a predominantly vegetated wetland landscape. Upon completion of the Breach III study in June 2013 the results from the entire study will be published in a final report to the California Department of Fish and Game.

Methods Developed for Marking Juvenile and Adult Delta Smelt

September 30, 2011

by Gonzalo Castillo

As part of a three-year project funded by Delta Science, the Stockton Fish and Wildlife Office and cooperators evaluated marking methods for juvenile and adult delta smelt. Development of these methods played a critical part in the 2008-2009 mark-recapture evaluations of entrainment losses at the south Delta's State Water Project, as reported in the U.S. Fish and Wildlife Service Journal on February 25, 2008 and August 7, 2009. A previous evaluation of striped bass predation further revealed no differences in consumption of marked and unmarked delta smelt (U.S. Fish and Wildlife Service Journal, June 24, 2010).



Marking tray containing juvenile delta smelt. Fish are inside an egg incubation tray immersed in calcein
Photo by Gonzalo Castillo, USFWS

Culture and marking of delta smelt were conducted in close collaboration with staff from the University of California (UC Davis), the Fish Conservation and Culture Laboratory (FCCL), the California Department of Fish and Game and the U.S. Bureau of Reclamation.

Researchers evaluated the use of calcein as a primary mark for batch marking juvenile and adult delta smelt. Although photonic marking was not deemed feasible for juveniles, it was evaluated as a secondary mark for adult delta smelt. Laboratory trials were conducted on delta smelt raised in captivity to examine calcein mark intensity and post-marking survival for juveniles and adults as well as photonic mark retention and post-marking survival of adults. The green fluorescence characteristic of calcein and its intensity were assessed with a calcein detector at six locations: scales, jaw, opercle, and pectoral, pelvic and caudal fins.

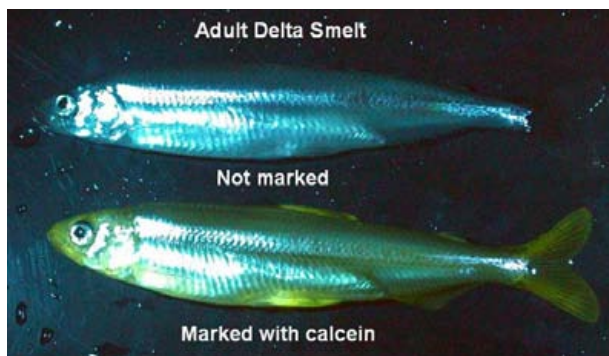


Photonic marking for adult delta smelt. Inset shows fish being marked in the anal fin
Photo by Gonzalo Castillo, USFWS

Adults were photonicallly marked in the fins: green-dorsal, white-dorsal, blue-caudal and blue-anal. Survival of calcein marked fish was high in juveniles and very high in adults. All marked juveniles and adults, and none of the control fish, showed marks seven days after exposure to low and high calcein concentrations and all immersion times ranging from 1 to 7 minutes.

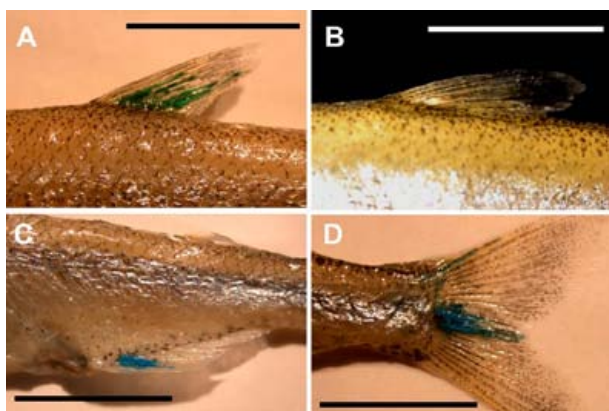
Calcein mark intensity was significantly higher in the jaw and pelvic fin of juveniles, and in the

Project Accomplishments



Calcein-marked and unmarked delta smelt
Photo by Jerry Morinaka, CDFG

pectoral and pelvic fins of adults. Photonically marked adults had very high post-marking survival at 70 days. Adult delta smelt had 100 percent mark retention at 102 days (calcein) and 97 days (photonic) following marking. Approximately 95 percent of photonic marks were visible to naked eye with the remaining being detectable under a dissecting scope.



Photonic marks on fins of adult delta smelt: A (green-dorsal), B (white-dorsal), C (blue-anal) and D (blue-caudal). Horizontal lines denote 1 cm.
Photo by Jerry Morinaka, CDFG

The main conclusions of this study were: 1) juvenile and adult delta smelt can be readily batch marked with calcein, resulting in high survival and mark retention over a period of weeks to months, and 2) the combined use of calcein and photonic marking for adult delta smelt resulted in high post-marking survival and 100 percent retention of both marks, for up to 3 months. These marking methods further enable identification of multiple groups while improving mark detection.

MORE GREAT WORK



Lake Cachuma California, site of a quagga/zebra mussel early detection workshop in 2011
Photo by USFWS



Abandoned farm tools discovered along the levees of Liberty Island
Photo by USFWS

Outreach and Education

Return of the Salmon Festival

October 16, 2010

by Greg Nelson

On October 16, 2010, the 20th Annual “Return of the Salmon Festival” was held at the Coleman National Fish Hatchery (CNFH), just east of Anderson, California. The festival provided an outreach opportunity for federal, state and local fish and wildlife organizations to educate the public and provide fun activities and natural resource information to people of all ages. The Delta Juvenile Fish Monitoring Program and the Aquatic Invasive Species Program teamed up and provided informational displays, brochures, coloring books, and temporary wildlife tattoos to visitors attending the festival. As always, children lined up to put on their wildlife tattoos and Julie Wolford, Greg Nelson, Paul Miklos and David LaPlante happily assisted them while explaining the importance of high quality salmon habitat and clean, healthy rivers and bays.



David LaPlante of the Stockton FWO selling novelties and ice-cream to visitors

Photo by USFWS

Other activities at the festival included salmon ladder and spawning operation viewing, egg incubation tours, the mobile salmon aquarium, a fish dissection/anatomy station, fish tagging and feeding, fly-fishing demonstrations, wildlife art, face and shirt painting, a Shasta Blood Center blood drive, and much more.

Stockton FWO participates in Water Tour for California Science and Technology Policy Fellows Program

November 10, 2010

by Patricia Brandes

Fish Biologist, Pat Brandes briefed students from the California Science and Technology Policy Fellows Program, on the role of the Delta Cross Channel (DCC) on water conveyance and juvenile salmon survival through the Sacramento-San Joaquin Delta. The briefing was part of a water tour of the Delta hosted by the Sacramento Region Water Forum. The group was introduced to California water issues by Tom Gohring of the Water Forum and was told about The Water Forum Agreement and Collaborative Policy Making by Jeff Loux of the Center for Collaborative Policy (CCP) at California State University, Sacramento. The group also visited the Freeport Regional Water Project and the M&T Staten Ranch as part of their tour.

The group met in the field at the Delta Cross Channel gates and listened to a presentation that explained the reasons behind the construction of the Delta Cross Channel, built in the 1950's by the U.S. Bureau of Reclamation. The DCC is designed to facilitate the movement of high quality Sacramento River water through the interior Delta, via the Mokelumne River, to the south Delta for export purposes. Brandes discussed the general life history of Chinook salmon in the Sacramento River basin, and the importance of the Delta to Chinook salmon in the Central Valley. Adult Chinook salmon swim upstream through the Delta to spawn in the upper rivers. The juveniles must migrate downstream through the Delta to reach the ocean. She also explained that the Sacramento River basin is unique in that it has four races of Chinook salmon; winter run (listed as endangered by the Endangered Species Act (ESA)), spring run (listed as threatened by the ESA) and fall and late-fall runs (species of concern).

The presentation focused on the results of studies conducted by our office on the impact

Outreach and Education

of the Delta Cross Channel on juvenile salmon survival through the Delta. Early studies using coded wire tag mark and recapture technology showed that survival is lower for juvenile salmon released into the interior Delta relative to those that migrate downstream via the main stem Sacramento River. These results indicated that the open Delta Cross Channel may contribute to lower survival of out-migrating juvenile Chinook salmon by allowing a greater proportion of fish to be diverted into the interior delta, than would be diverted with the Delta Cross Channel closed.

In recent years we have been using acoustic tag technology to more accurately determine how fish behave at various junctions in the Delta, specifically at the Delta Cross Channel and Georgiana Slough. This relatively new technology allows survival for specific routes to be estimated. As a result of the early coded wire tag work we have done the Delta Cross Channel gates have been closed during periods of high abundance of out-migrating juvenile salmon in order to reduce the likelihood of these juveniles entering the interior delta. Using the acoustic tag technology, we have found that closing the channel gates does not always provide as large a benefit as has been assumed in the past. Sometimes when the gates are closed a greater proportion of the tagged salmon enter the interior delta through Georgiana Slough, a natural route from the Sacramento River to the interior delta, than when the gates are open. The proportion of salmon that migrate through the interior Delta through Georgiana Slough or the open Delta Cross Channel is a function of downstream flow and the tides. More fish can be exposed to both diversions multiple times, when the flows are low and during a flood tide due to the fish moving both upstream and downstream during these times.

Brandes informed the tour participants of the studies that have been conducted to date that are associated with diversion of juvenile salmon into the interior Delta through either the Delta Cross Channel or Georgiana Slough. Many of the students asked questions and were

very interested in the information presented. Sarah Foley, Director of the Water Forum, was appreciative of Brandes helping the students understand some of the issues associated with California's "plumbing."

FWS Organizes Second Stanislaus River Salmon Festival

November 14, 2010

by J.D. Wikert

On Nov. 14, 2010 Stockton FWO staff took the lead in organizing a festival to celebrate the return of fall-run Chinook salmon to the Stanislaus River in California.



USFWS biologists provide temporary salmon tattoos to children attending the festival

Photo by Ramon Martin, USFWS

The second annual event featured a number of interactive activities, and focused on providing opportunities to connect children with nature. Approximately 3,000 people attended the event, doubling the attendance of the 2009 inaugural Stanislaus River Salmon Festival.

Partnerships with agencies, consultants, non-profits, and other organizations made the event a success. The East Stanislaus Resource Conservation District, Modesto Junior College, The Great Valley Museum, California

Outreach and Education

Department of Fish and Game, and the U.S. Army Corps of Engineers played key roles in organizing the event.

The event offered a variety of opportunities for outdoor education including watching otolith (ear bones used to determine the age of the fish) removal from salmon carcasses, a challenging salmon obstacle course, fly-fishing demonstrations, making salmon egg bracelets, applying temporary wildlife tattoos, watching salmon spawn in the river, and making your



Proud award winners from the salmon festival art calendar contest

Photo by Ramon Martin, USFWS

own Gyotaku (fish print) t-shirts. The event included a salmon art contest among K-6 schools from the local community. The winning art was included in a festival calendar that was sold at the event. The calendar included local events and descriptions of salmon life history by month.

The U.S. Army Corps of Engineers' Knights Ferry Park museum showed videos about salmon and rivers and offered interpretive displays about the area's natural history. Freshly cooked salmon was offered at bargain prices by the Lions Club, 4-H provided hot dogs, and the Knights Ferry School conducted a bake sale.

In addition to organizing the event, we provided information on salmon, restoration, monitoring, and aquatic nuisance species, helped out with exhibitor setup/cleanup, and directed traffic.

Dinner with a Scientist

December 21, 2010

by Patricia Brandes & J.D. Wikert

It's not often scientists get treated as celebrities but recently two biologists from the U.S. Fish and Wildlife Service's Stockton FWO had that happen.

Pat Brandes and J.D. Wikert participated in the San Joaquin County Office of Education's 13th Annual Dinner with a Scientist on November 16, 2010 at the University of the Pacific. The Dinner with a Scientist Program is a forum for local middle and high school students to interact with professional scientists from many different disciplines.

The event was attended by 50 teachers and 150 students from various San Joaquin County schools, and 29 scientists. Attendees were divided into small groups with one or two scientists at a table for dinner. The students and their teachers had an opportunity to learn about science and science careers. The Dinner with a Scientist Program also included a 20-question, science competition. During dessert, students and teachers had an opportunity to move to another table and interview other scientists.



Dinner with a scientist participants

Photo by Cathy Parker, San Joaquin County Office of Education

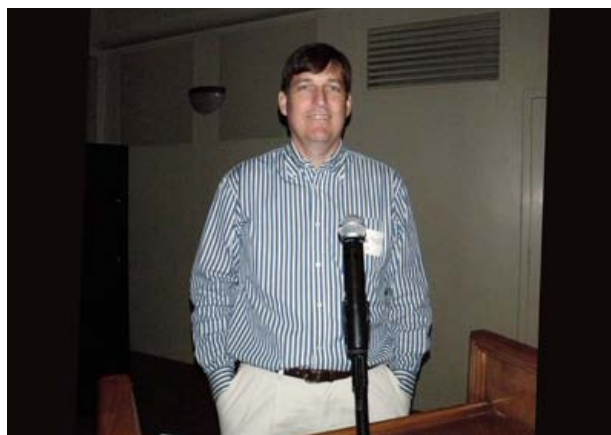
The key-note speaker for this year's event was our very own J.D. Wikert. In his presentation, J.D. encouraged all of the students to think about how things work, and to consider becoming scientists.

Outreach and Education

Pat's experience and observations

The students and teachers asked questions about what I did, what happens if I make a mistake in my job, how did my job affect my family and family time, and what didn't I like about my job. I also explained that I studied juvenile salmon survival in the Delta by releasing and recovering tagged fish. I also shared that the Service supported me in working part-time for many years to allow me work around my sons' school schedules. The students and their teachers were interested in the local fish in the Delta, the egg development and lifecycle of salmon and the impact of invasive plants and animals on the ecosystem. They were provided with brochures on Careers in the Fish and Wildlife Service, Why save Endangered Species and Don't Plant a Pest. In addition, they each got a pencil and a sticker from the Service Aquatic Invasive Species Program to remind them not to release left-over bait into the rivers.

The students in my groups wanted to be marine biologists, engineers, chemists and microbiologists. One young man visited my table for the second year in a row and said he had read all of the brochures I had provided him previously. He reminded me that I told him "I'd be looking for him in the field one day" as he wanted to be a fish biologist. It was a pleasure spending the evening with the students and their teachers.



Key note speaker J.D. Wikert, USFWS
Photo by USFWS

J.D.'s experience and thoughts

The students were very interested in the experiences I related as part of my presentation, and were especially interested in fish.

I was asked about the best part of my job and replied that the satisfaction of seeing a successful restoration project was very rewarding.

During my presentation, I encouraged students to seek out and embrace science opportunities and gave examples of steps they could take to become more proficient in science. Many of the students were interested in the exciting opportunities that I was afforded by my career path. Among the most popular were the encounters with hippos and black mambas on a trip to Malawi, Africa during graduate school, and encounters with alligators in the Florida Everglades. It was exciting to see the enthusiasm and level of knowledge among the students. It was especially rewarding to have represented the profession of fisheries biologist, as several children were not even aware that you could be paid to study fish! The Dinner with a Scientist Program has grown beyond San Joaquin County, and events are now being held in Merced, Stanislaus, and Tuolumne counties as well. This is the eleventh year our office has participated in the San Joaquin County Dinner with a Scientist Program and with luck we will continue to have a positive presence at this event.

Staff Helps Third Graders Plant Native Trees and Shrubs

March 9, 2011

by Amber Aguilera

On March 9, 2011, Denise Barnard, Paul Miklos, Phil Voong, Kate Erly, and Amber Aguilera from our office participated in the Stone Lakes National Wildlife Refuge Habitat Restoration Day.

Stone Lakes Wildlife Refuge is located just south of Elk Grove, California, and manages over 6,200 acres. The land was once used for

Outreach and Education



USFWS employees Denise Barnard and Amber Aguilera get ready to plant native trees at Stone Lakes National Wildlife Refuge
Photo by USFWS

farming and is undergoing restoration to more resemble its historical wetland background. Along with nine other local Service employees, we helped plant native trees and shrubs with 75 third graders from nearby Stone Lakes Elementary School.

Students were divided into small groups,

and planted elderberry, coyote bush, California rose, valley oak, Santa Barbara sedge, and mugwort with the help of a Service group leader. By the end of the two hour planting period, the refuge looked much healthier and was rich with native plant life. Children were thrilled by the wildlife that inhabit the refuge and felt a sense of accomplishment at the end of the day. Not only did they leave with an appreciation of the refuge but they also received Service carabineer compasses for all their hard work.

Merced River Salmonid Habitat Restoration and Education

April 1, 2011

by Michelle Workman

On a beautiful day in April, we co-hosted a field trip to the Merced River Ranch restoration site, along with Cramer Fish Sciences (CFS) staff, to teach students about the importance of restoration, and some of the finer techniques involved in assessing the available habitat. Some of the educational stations included: seining for juvenile fish, sampling for macro-invertebrates, conducting pebble counts, and measuring water temperature and dissolved oxygen.

The Anadromous Fish Restoration Program (AFRP) has funded, permitted, and begun habitat restoration activities at the Merced River Ranch site on the Merced River. Not only are these activities benefitting the resource, they are providing an ongoing educational opportunity for the students of Snelling Middle School.

The AFRP is currently funding a project on the Merced River that will rehabilitate 1¼ miles of river channel and add 6 acres of floodplain and side-channel habitat on California Department of Fish and Game owned land alongside the Merced River near the town of Snelling. This area of the river has been impacted by mining operations and the construction of dams. The combination of these impacts has altered available spawning habitat for adult salmonids and limited opportunities for floodplain and side-channel rearing for juvenile salmonids.



Michelle Workman, USFWS, shows students how to conduct pebble counts on the Merced River
Photo by Nathan Quevedo, Merced Sun Times

This restoration grant, awarded to Cramer Fish Sciences, will improve conditions for salmonids in this reach of river as well as serve as an opportunity for public access and education for the local community. As an important part of the project's outreach, the Service and Cramer Fish Sciences has been meeting regularly with the middle school classes of Karen White (4th/5th grade), and Joyce Mattos (6th/7th grade) to inspire the

Outreach and Education

next generation of restoration ecologists by giving them a living lab right in their own backyard.

These activities were all explained in the context of the importance for fish habitat and river function and how these measurements help us monitor the success of our restoration projects. The Merced River Ranch project is in the first of 3-5 years of on the ground restoration work, and we anticipate many more opportunities to engage the local public and get them excited about restoring their river.

Bring A Child to Work Day Goes Ranching in Wilton

April 19, 2011

by Gonzalo Castillo

On April 19, 2011, Pam Tarelli, David Dominguez, Jerrica Lewis, Patrick Hapgood and Gonzalo Castillo along with an additional 20 Service employees from other area offices, 12 volunteers, and 38 children participated in the annual Bring a Child to Work Day.



Zayne Lewis (left) and Wyland Hapgood (right) riding horses led by Ranch hands

Photo by USFWS

The event was organized by Dara Rodriguez (USFWS, Region 8, Sacramento) in coordination with the California Rangeland Conservation Coalition and it was hosted by the Five Star Land & Livestock Ranch in Wilton, California, a fifth

generation family operated business. The ranch raises Angus cattle. It also produces cutting horses, trained to separate individual animals from a cattle herd. Children participated in groups, rotating many activities throughout the day. They enjoyed riding horses, coloring wildlife drawings, egg and spoon walk, cattle roping (lassoing a plastic bull), throwing cow patties the farthest like Frisbee's, and the potato sack race. We took short and long tours to see the bulls and horses.



Building bird houses. Left: Baylee Brown under the guidance of Pam Tarelli. Right: Luisa Castillo, age 5
Photo by USFWS

We learned the difference in cattle breeds and their meat, about cattle auctions and how the ranch makes money while conserving wildlife habitat. Other animals we encountered included horses, their foals, and ranch dogs. We learned about wild animals that also live at the ranch such as birds and squirrels. Building a birdhouse and enjoying a nice barbecue of hot dogs and hamburgers rounded out the day nicely.

Wilson Elementary School Hosts First Annual Science Day

April 29, 2011

by Pam Tarelli

Wilson Elementary School in Modesto, California invited our office to participate in their first annual science day on April 29, 2011. Three hundred kindergarten through sixth grade students spent the day exploring science with forty hands-on exhibits provided by local businesses, volunteers and government agencies.

Outreach and Education

Two of our skilled Biological Science Technicians, Julie Wolford and Pam Tarelli, presented four one-hour long interactive sessions for the students. In each session, students were able to watch a short video about the life cycle of salmon, perform a mock beach seine, and learn how to tag fake fish using various tagging techniques. An aquarium with live fish also was on display to show the students what fish species can be found in their local area.

The students made salmon egg bracelets while being quizzed on, and subsequently rewarded with prizes for their fish knowledge. At the close of each session, each student received a gift bag of fun and informational items, and a wealth of knowledge on fish biology and management.

Local Service Staff Participate at the 'Green on the Stream' Festival in Modesto, California

May 21, 2011

by Carl Mesick



Carl Mesick, USFWS Fish Biologist, explains the effects of water management on the salmon populations in the Tuolumne River
Photo by Zac Jackson, USFWS

Zac Jackson and Carl Mesick, biologists and Habitat Restoration Coordinators, participated on the "Green on the Stream" festival, which was on the Tuolumne River at Legion Park in Modesto, California, on May 21, 2011.

The purpose of the festival was to promote parks for people, a

healthy river, and livable communities by making the lower Tuolumne River Parkway a centerpiece of the community where friends and families can explore, enjoy and learn about the River. The festival, now in its third year, was sponsored by the Tuolumne River Preservation Trust and other local businesses and environmental groups.

The California Department of Fish and Game and environmental firm FishBio also had booths at the festival. The Service distributed water bottles, rulers, and carabineers to children and showcased the salmon life cycle as well as invasive species that are prevalent in the Central Valley of California.

We also had posters and displays on habitat restoration activities and anadromous fish population trends and showed how these are affected by water management. Many adult visitors were concerned about the low numbers of salmon returning to the river and were interested in the display on fish population trends. The display showed how the magnitude of flow releases from Don Pedro Reservoir (a major impoundment on the Tuolumne river) during the spring was highly correlated with the number of juvenile salmon migrating from the Tuolumne River and the number of adult salmon that returned two to four years later.

Service biologists explained how low spring flow releases affect water temperature, which affects the ability of the juvenile salmon to undergo smoltification (the process juvenile salmon undergo to prepare for life in saltwater). The process of smoltification not only requires low water temperatures, but it is also highly stressful, which causes the juveniles to be susceptible to disease if water conditions aren't within an acceptable range. Most visitors said that it was important to them to maintain the salmon population in the Tuolumne River.

Stockton FWO has a Strong Presence at the 2011 California State Fair

July 30, 2011

by Beth Campbell & Jerrica Lewis

We had a strong presence at the U.S. Fish and Wildlife Service's exhibit at the 2011 California State Fair, which was held from July 14 through July 31 in Sacramento. Twenty one staff members from all three Programs from our office participated in the 2011 California State Fair.

The USFWS partnered this year with the U.S. Bureau of Reclamation and U.S. Bureau of

Outreach and Education

Land Management to follow the recent presidential initiative to help inform the public about “America’s Great Outdoors.” The State Fair is always a fun and exciting event for staff because California offers such a great diversity of landscapes and ecosystems – including freshwater, estuarine, and saltwater habitats populated by a diverse variety of plants and wildlife.



Beth Campbell of the U.S. Fish and Wildlife Service helps children learn about fish as they paint a fish print at the California State Fair
Photo by USFWS

Activities at the Service exhibit this year included outdoor-themed tattoos, painting fish prints, making wildlife masks, coloring nature printouts, and playing “bird bingo.” These provided an opportunity to teach the public about fish and wildlife biology. Making water cycle bracelets also was fun and informative; concepts such as evaporation, condensation, and precipitation were discussed and tracked with beads of different colors. Various posters and displays throughout the exhibit were enjoyed by young and old alike.



Kate Erly, USFWS, informs children about the plants and animals that occur in California
Photo by USFWS

The Green Screen photography was a real attraction to get families together. Participants could pick out which National Monument or National Park background they wanted for their photo. This was a fun way to let the public know about “America’s Great Outdoors.” The Service exhibit was well attended, and our staff reported that it was great being able to have face time with so many members of the public.

Calling Back the Salmon Celebration in the Auburn Ravine

September 17, 2011

by Elizabeth Campbell & Kes Benn



Kes Benn, Stockton FWO fish biologist, explaining the salmon life cycle while helping children make salmon egg bracelets
Photo by USFWS

Kes Benn and Beth Campbell represented our office at the 2nd Annual Calling Back the Salmon Celebration held at McBean Park in Lincoln, California, Saturday, September 17, 2011. McBean Park is adjacent to Auburn Ravine, a small watershed that continues to support reduced numbers of salmon and steelhead

despite the presence of several man-made barriers to fish passage.

The Calling Back the Salmon Celebration offered activities for children and families intended to educate them about nature and the environment, and in particular about salmon in Auburn Ravine. Emphasis was placed on how historic and current human activity within the watershed can negatively affect salmon populations, and various ways that local landowners or interested parties can get involved to help reverse such trends.

Outreach and Education

Hundreds of people attended the event. Kes and Beth explained the salmon life cycle while dispensing fish and wildlife tattoos and assisting kids with the construction of “salmon egg” bracelets. Our biologists discussed local watershed conditions and salmon fishing with parents and other adults.

Participants also included the National Marine Fisheries Service, California Department of Fish and Game, California Department of Water Resources, and Wildlands Inc.; local groups focusing on issues such as light pollution, appropriate land use, and fishing; and primary sponsors, including the Wildlife Heritage Foundation and Save Auburn Ravine Salmon and Steelhead (SARSAS). California Conservation Corps members from the local Placer Center assisted all participants and were great role models for attendees. The traditional “calling back” of the salmon ceremony was conducted by local Native Americans the following day on Sunday morning, September 18.

Voyage Takes an ‘Elementary’ Look at the Delta

March 28, 2011

by Jackie Hagen

Students from the Bidwell Elementary School in Pittsburg, California, were treated to a three-hour Delta Cruise on March 28, 2011, as part of an education program about the Delta and Kirker Creek watersheds created by Partners of the Watershed.



Service Biologist Beth Campbell shows students how to use a secchi disc to measure water clarity
Photo by USFWS

The thirty-two life-jacket-clad 4th graders boarded the Island Serenade, docked at the Pittsburg Harbor, for a delta discovery voyage that took the children onto the San Joaquin River, Broad Slough and Suisun Bay. The vessel stopped at several islands along the voyage to collect benthic, water, and plankton samples. These samples were then examined by the students at three stations that they rotated through during the voyage. The three stations included Water quality, Benthic/Plankton and Secchi, and Food Chain/Invasive Species.

The field trip was the 8th voyage of an education program about the Delta and Kirker Creek watersheds created by Partners of the Watershed. The partnership is a collaboration of the City of Pittsburg, Pittsburg Unified School District, Los Medanos College, California Department of Fish and Game, DOW Chemical, and Delta Discovery Cruises and our office. Stockton FWO fish biologist and habitat restoration coordinator Beth Campbell and small craft operator Jackie Hagen assisted by leading the Benthic, Plankton, and Secchi station as well as providing information on habitat requirements for native fish species.

Stockton FWO Partners with Beale Air Force Base for Earth Week Activities

April 18, 2011

by Beth Campbell

On Monday, April 18, 2011, fish biologist Beth Campbell, represented the our office during the Earth Week event at Beale Air Force Base (AFB) in Marysville, California. Beale AFB has an active natural resources conservation program, and the Earth Week’s theme was “We All Live Downstream,” a water-based, anti-pollution theme.

Beale AFB water resources include Dry Creek, a small tributary to the Bear River, in which Chinook salmon have been observed, and several ponds that are utilized by base personnel for recreational fishing of a variety of

Working with Others



Service biologist Beth Campbell talked to many service members during Earth Week festivities at Beale AFB

Photo by USFWS

species such as largemouth bass and bluegill. These resources are important habitat for a variety of wildlife, including local and migratory birds, frogs and turtles.

Beth provided Air Force personnel and their families' information about the salmon life cycle, and Beale AFB staff provided

information about energy conservation and ways to prevent pollution. In addition to educational information, Beth got to share fishing stories with service members from across the United States.

John Pedretti Conducts Fish Identification Course to Increase Identification Skills

April 14, 2011

by Paul Miklos

We offered a fish identification course at our office, on April 14th, 2011. John Pedretti led the course which emphasized the fishes of the Sacramento-San Joaquin Delta estuary. The course was taught to increase the fish identification skills of our new and existing employees as well as staff from the California Department of Fish and Game.

The course was structured into two sections: lecture and lab. The lecture section of the class was offered in the morning and provided information on the life history and morphological traits of fishes found within the Delta. The lab section of the course was offered in the afternoon and gave students hands-on experience identifying preserved fishes collected from throughout the Sacramento, San Joaquin rivers and delta. To help facilitate the course, we also provided a large variety of detailed fish pictures



Bluegill sunfish (above) and redear sunfish (below), two closely related fish species that can be misidentified in the field without proper training
Photo by USFWS

and unique morphological keys.

After the lecture portion of the course was completed, all of our staff were challenged with a quiz to determine their skill level regarding fish identification, while staff from other agencies were offered more time with the instructor and preserved specimens. The test scores will help us to determine each employee's progress and accuracy in fish identification. This course was and will continue to be a real benefit in promoting interagency cooperation and strengthening the integrity of the fish data collected by the STFWO and other agencies.

Partnering up for the Health of It

June 7, 2011

by Jackie Hagen

Jackie Hagen, our safety officer, buckled up ten dummies (CPR dummies that is...) into her car and headed out to Stone Lakes National Wildlife Refuge headquarters for a day of CPR training on June 7th, 2011. This was the second time the Refuge received their certification from Jackie. The next training they will receive from Jackie will be Automated External Defibrillation (AED) training, as soon

Working with Others



Denise Barnard instructs Service staff on the proper use of an Automatic External Defibrillator or AED
Photo by USFWS

as their new unit is purchased.

Jackie has been providing CPR, AED & First Aid training to State and Federal personnel in Stockton for over 15 years. Now, with the encouragement of her managers, Jackie has taken her “show” on the road. She doesn’t teach all the courses alone though; recently Denise Barnard received her instructor certification and has been teaming up with Jackie to get Service personnel certified.

On July 7th, 2011, Denise and Jackie taught CPR, AED & First Aid to 11 Service staff from the Bay Delta Fish and Wildlife Office in Sacramento. The course went very well, and good news, all students passed the class!

Pacific Southwest Regions Conducts Workshops for Early Detection Monitoring for Quagga and Zebra Mussels

June 21, 2011

by Jonathan Thompson

Nationwide, the costs of controlling and managing invasive species has exceeded billions of dollars. In 2010, Sam Hamilton, at the time the Director of the U.S. Fish & Wildlife Service (USFWS), said invasive species are “probably the single greatest

threat in our country to our native wildlife.”

“Invasive species”, as defined in Executive Order 13112 (signed by President Clinton in 1999), means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Zebra and quagga mussels are freshwater invasive species that



Zebra mussels attached to a native freshwater mussel
Photo by USFWS

are established in several water bodies within California and Nevada.

In 2007, a population of quagga mussels was discovered in Lake Mead and mussels were subsequently discovered in Lakes Mohave and Havasu in the Colorado River and in the Colorado River Aqueduct System which serves southern California. Additionally, a population of zebra mussels was discovered in San Justo Reservoir in 2008. The impacts that are already occurring due to these introductions include but are not limited to millions of dollars being spent to manage the quagga mussels in the Colorado River Aqueduct System, a quarantine of San Justo reservoir, and recreational boaters having to spend time and money on inspections and decontamination. Quagga and zebra mussels are spread through human mediated pathways such as ballast water and hull fouling in the shipping industry and tailored recreational boats.

Many collaborations between state, federal, and local government and non-government

Working with Others

partners have been created to work on preventing, managing, and controlling the quagga and zebra mussels. As part of the effort to prevent the spread of the quagga and zebra mussel to areas where they are not introduced, the USFWS Pacific Southwest Regional Aquatic Invasive Species Program has conducted 10 workshops for the general public and organizations including water districts, California State Parks, National Park Service, California Department of Fish and



Lake Murray docks in La Mesa, California. Participants are learning about tactile searches for quagga mussels
Photo by Ronald Smith, USFWS

Game, San Diego River Park Foundation, and others.

The goal of these workshops is to educate interested parties about monitoring for the quagga and zebra mussel in order to discover them at the early stages of an introduction. Detection of new populations allows for the implementation of management actions such as limiting or closing boat traffic and/or control options such as chemical and/or mechanical removal of the newly established mussels.

Participants at the workshops are given information about the quagga and zebra mussel life-history, current established populations,

and early detection monitoring techniques. In addition, participants receive an overview of invasive species topics including information on invasive species pathways, identification, impacts, and tools to prevent their spread. The workshops were previously funded through a grant from CALFED (now the Delta Science Program) and are still available as part of the Aquatic Invasive Species Program. The workshops have been conducted through collaboration with the following partners: California Department of Fish and Game, San Diego River Park Foundation, East Bay Municipal Water District, City of San Diego, Salmonid Restoration Federation, California State Parks, Lake Cachuma Recreation Area, North Bay Watershed Association and California Sea Grant. The workshops were started in October 2010 and were held within California at various locations from Arcata to Lake Tahoe to San Diego. The workshops are continuing throughout 2011 and there are plans



Aquatic Invasive Species biologist Jonathan Thompson helping participants learn species identification
Photo by USFWS

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Sunrise at Liberty Island
Photo by USFWS